CANCER OF THE STOMACH—SURGICAL TREATMENT OF ADVANCED CASES*

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DISCUSSION *by Leo Eloesser, M. D., San Francisco; Edmund Butler, M. D., San Francisco.*

ONE-THIRD of all cancers in men and one-fifth of all cancers in women originate in the stomach. In San Francisco at least three hundred persons die yearly from this disease. The records of the San Francisco Board of Health, of deaths from cancer of the stomach for each year from 1925 to 1929, are as follows:

1925	317
1926	296
1927	271
1928	340
1929	319

Only 93 of these 319 were explored by operation. I have no way of finding on how many of these patients a radical operation was performed. Undoubtedly the great majority of these ninety-three operations were exploratory laparotomies and gastro-enterostomies. This means that the great majority of patients with gastric cancer run the entire course of the disease without the only treatment that might have been curative—a radical operation.

Two years ago, there appeared in *The Journal of the American Medical Association* a very interesting survey on the average treatment of cancer. The authors showed that a radical operation was done in only five to six per cent of all patients with gastric cancer.

I am convinced that a similar showing would obtain for San Francisco as was found for Detroit. It is hard for a surgeon to understand the therapeutic pessimism of these figures. The statistics of well known clinics show that at least one-third of all gastric cancers are operable.

A surgeon willing to attack the extreme cases can keep the mortality well under 25 per cent. At least 20 per cent have a chance of a five-year cure.

To give the entire picture with these averages as a basis: 100 cases—33 resections; 8 deaths; 25 left; 5 cures. But this does not tell the whole story. The radical operation which removes a large ulcerating cancer gives the patient great relief from pain. Even if the cancer recurs, at least one year of postoperative comfort and well-being can be expected after a resection. The patient who for two years remains free from recurrence of the cancer has a 50 per cent chance of permanent cure.

REVIEW OF ANSCHUETZ' SURVEY OF ONE THOUSAND CASES

My special subject deals with advanced cases of cancer of the stomach. Anschuetz makes an interesting survey of his material covering one thousand cases. He divides the cancers into three classes.

1. All easily operable tumors with few or no involved glands.

2. Badly adherent tumors, frequently requiring resection of mesocolon, pancreas, liver, and colon.

3. Patients in whom cancerous glands and liver metastases were left behind after a palliative resection had been done. Furthermore, cases in which inspection of the gross specimen showed that the operation had not been radical on the gastric or duodenal line of resection.

This graphic curve of Anscheutz shows what finally became of the cases in the three groups.

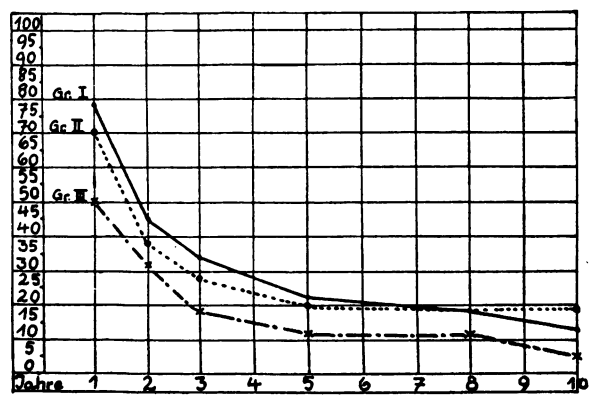

Fig. 1.—Graphic curve of Anschuetz.

The conclusion is inevitable that the results for the large adherent cancers of group two are just as good as for the small favorable cases of group one. Finsterer and others have confirmed these findings. Finsterer has 28 per cent cures for group two and 31 per cent for group one. The comparatively good showing of the group three cases means that some of these cases were not so hopeless as they appeared; that enlarged glands left behind were not cancerous; that resection very close to the tumor had occasionally effected a cure. Balfour of the Mayo Clinic has recently emphasized the fact that there may be a long period of well-being after palliative resection.

In the absence of demonstrable metastases an exploratory operation is nearly always indicated. A large palpable tumor should never counter-indicate exploration. These are often the favorable cases. The nonpalpable ones may be those of the lesser curvature or the diffusely infiltrating types. I wish to emphasize that the x-ray report should not keep the surgeon from exploring. In many instances cases that appear inoperable in the x-ray picture are operable. After opening the abdomen, technical difficulties, such as invasion of the surrounding organs by the tumor, should not hinder a radical operation.

In fact we often do not know at the time of the operation which will be the favorable cases. All attempts to prognosticate from the location of the tumor or the microscopic pathology have failed in cancer of the stomach. Listed among the patients who are cured for over five years, we find just as many cancers that originated from

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TABLE 1.—*Cases and Operations Reported*

	Patients with Cancer of Stomach	Number of Radical Operations	Percentage of Total	Patients with Cancer of Breast	Number of Radical Operations
Detroit	717	28	5.5%	75	58
and Middlewestern cities	1072	67	6.1%	—	—

the lesser curvature as we find cancers of the pylorus; we find all pathological types—scirrhous cancers, soft ulcerating adenocarcinomas, etc.; and also we find among the five-year cures, cases that required colon resection, etc. Fatality to the patient does not depend on the size of the tumor nor the adhesions to surrounding organs. Extensive lymphatic involvement is, however, a bad prognostic symptom.

CLASSIFICATION OF BADLY ADHERENT TUMORS—REQUIRING RESECTION OF ADJACENT STRUCTURES

These findings justify attempts to do radical operations in the very advanced badly adherent tumors which I group as follows:

1. *Cancers Above the Middle of the Lesser Curvature.*—These are frequently regarded inoperable, but are sometimes good cases for radical operation; as, for instance, a case of large polypous cancer.

Outline of Technique: For the advanced cases my incision is more often oblique below the left costal margin than a midline incision. I use the Billroth II method in the generally accepted Polya modification. I use a long loop of jejunum, anterior to the colon with an entero-anastomosis more often than the short retrocolic procedure. I usually do a partial occlusion of the gastric stump at the lesser curvature, and place the distal part of the jejunum at the lesser curvature in the antecolic technique. This I consider, mechanically, the most satisfactory procedure. From my experience I warn against any two-stage operation. Reoperation after a short time finds the stomach brittle and edematous. Reoperation after too long a time finds rapidly grown cancer.

2. *Cancer with Continuous Growth into Liver.* These cases can sometimes be made operable by a wedge-shaped excision of the liver and immediate suturing of the defect. This condition is rare; in Finsterer's material it occurred only six times out of 193 cases.

3. *Cancer Invading the Pancreas.*—(a) Very dense adhesions, often encountered between the posterior wall of stomach and pancreas, do not interfere with a radical operation. (b) The direct invasion of the gastric cancer into the pancreas is usually considered as contraindicating resection, because of the danger of pancreatic juice causing leakage of the suture line and subsequent peritonitis.

In view of Finsterer's results, it is doubtful whether this view can be upheld. In his forty-three cases, involving resection of the pancreas, there were only nine deaths—20 per cent mortality.

4. *Cases with Extensive Infiltration of Transverse Mesocolon.*—This is the most common complication. In the majority of these cases it is possible to separate the middle colic artery from the tumor, so that this complication does not preclude a radical operation.

5. *Cases Requiring Resection of the Transverse Colon in Addition to the Resection of the Stomach.*—This necessity arises, owing to in-

TABLE 2.—*Statistics of Well Known Operators*

	Total Cases	Percentage of Resections	Mortality	Five Year Cures
Mayo	6000	25%	13%	25%
Payr	475	30%	30%	20%
Von Eiselsberg	457	36%	25%	27%
Anschuetz	926	52%	Group I—15% Group II—50%	Group I—22% Group II—30%
Finsterer	797	65%	Group I— 7% Group II—37%	Group I—31% Group II—28%

TABLE 3.—*Results of Operation in Groups 1, 2, and 3*

First Postoperative Year	Second Postoperative Year	Fifth Postoperative Year
Group 1—Only 20 per cent died.	Rapid decline.	21% still alive
Group 2—A heavy loss.	Rapid decline.	20% still alive } Notice approximation of curves.
Group 3—50 per cent died.	Remain surprisingly resistant.	12% still alive

vasion of the transverse mesocolon by the tumor. In order to perform a radical operation, ligation of the middle colic artery becomes necessary. The high mortality of these patients can be reduced by more careful selection. One certain type of cancer especially justifies this operation, namely, the large polypous tumor of the greater curvature which has invaded the lesser mesocolon or the colon itself. These tumors are less malignant. Frequently they do not invade the regional glands, or lead to distant metastases.

In cases involving close proximity of the middle colic artery to the tumor, I prefer to free the artery rather than be compelled to do a stomach-colon resection. Finsterer also advises heroic attempts to free the colic artery.

Technique of the Combined Stomach-Colon Resection: This presents very interesting problems. One of these is whether to excise the large tumor of the stomach in one piece with the colon, or do the stomach resection first and then the colon resection. If only a small branch of colic artery has been sacrificed it will be often advisable to finish the stomach operation as usual, and then investigate the blood supply of the colon. The rule to follow, however, is, if the trunk or one of the major branches of the middle colic artery has been ligated in dissecting the tumor out of the mesocolon, the transverse colon is in danger of gangrene and it is better to resect stomach and colon as one. This time-saving procedure is more radical. Another technical problem involved is the question of a one-stage or two-stage operation on the transverse colon.

The two-stage operation of the Miculicz type is the method of choice if the stomach operation has been very difficult and we want to finish quickly.

The one-stage resection again has different possibilities. If only a short portion of the colon has been resected, an end-to-end union without tension may be possible, but when the blood supply of large portions of the colon has been cut off, it is not possible to unite the cut ends of the colon without tension. In these cases the one-stage operation requires either a complete resection including ascending colon and cecum with the implantation of the ileum into the remaining transverse colon, or an operation of partial or total colonic exclusion. These exclusion operations have certain dangers, namely, in the partial exclusion, retrograde filling with final perforation.

The average mortality of these extensive operations has been compiled by Mau as 55 per cent from seventy-five cases. Of the twenty-four who survived the operation and could be followed up, there were, however, seven cures over five years, that is 29 per cent of those who survived the operation.

6. *Cases of Invasion of the Right Wall of the Esophagus.*—Eighteen cases were listed in Finsterer's material with eight deaths, a 44 per cent mortality. In these cases Finsterer extended the excision of tissue into the esophagus, doing partial longitudinal resection of the wall of the esophagus. He folded the fundus of the stomach around the esophagus for protection of the suture line.

7. *Cancer of the Cardiac End of the Stomach.* These present the most difficult problem of all. They are not infrequent, being about 10 per cent of all gastric cancers. A great majority of these are absolutely inoperable. Only nine successful cases of resection of the cardia have been done. These nine cases survived out of a total number of thirty-one that could be compiled by Borchers, making a mortality of 71 per cent. The mortality is probably much higher as undoubtedly hundreds of unsuccessful attempts have not been published. The high mortality is due to the great difficulty in safely anastomosing the esophagus to the stomach. The late results of these nine cases which survived are interesting. One case of Peugniez' was still alive and well twelve years after operation. Five others were well after four or more years. All of these cases were approached by laparotomy. In all the ingenious attempts to attack a cancer of the cardia from the transthoracic approach, from the posterior mediastinum or transpleurally, the mortality has been greater. Only two have survived this approach—patients of Zaijer and Hedblom. In these two operations the result was very unsatisfactory on account of persisting gastric and esophageal fistulas, while in the above nine instances the patients were really well.

The result of this survey is that the resection of the cardia should only be attempted in cases where the operation can be done by laparotomy. This limits the field to those cases where only a very short area of the esophagus is involved by the cancer. Only a few centimeters of esophagus can be successfully resected from the abdominal route. The maximum has been four centimeters. Primary cancers of the esophagus should be entirely excluded from any attempt at a removal by laparotomy.

The type of cancer that lends itself best to this operation is the polypous cancer near the cardia. In a case of this type in a man fifty-eight years old, which I had recently, I lost the patient on the fourth day from bilateral bronchopneumonia. I employed the following technique:

Technique (Main Points): 1. Marwedel incision, *i. e.*, incision along costal margin with mobilization of the latter by cutting of the seventh, eighth, and ninth costal cartilages laterally and mesially. This incision I have also recently used twice for operations of diaphragmatic hernia. It gives the best access to the cardia.

2. Complete severing of all connections and mobilizing the lower esophagus.

3. The stomach is divided first at the pyloric end. The upper stump is then used for traction while completing at least the first posterior suture line connecting the esophagus to the pyloric stump of the stomach.

4. The most important and difficult part of the operation is the anastomosis. The essential thing is to invaginate as long a piece of the esophagus as possible into a cuff of stomach wall.

5. Finally the stump of the stomach has to be sutured to the diaphragm to avoid tension on the anastomosis. This is also very important.

8. *Tumors Which Require Removal of the Entire Stomach.*—Total gastrectomy is a less dangerous operation than the resection of the cardia. Only nine cases have survived resection of the cardia, while thirty-one have survived total gastrectomy. The resection of the cardia involves more of an esophageal resection. In a total resection, one may even be fortunate to have a peritoneal covering of the lower esophagus for anastomosis. The main indication for total gastrectomy has been the so-called "leather bottle" stomach, a form of cancer causing shrinkage of the stomach.

Total removal in the strict sense means that, in the specimen, part of the esophagus, as well as duodenum, can be demonstrated. Finney and Rienhoff have recently presented a complete study of these cases from the entire literature. They had five cases of their own of total gastrectomy and compiled 122 additional. Only one-half of these were total in the above sense. The other half were subtotal. The subtotal were limited to cases where not more than three centimeters of the stomach was left. Of the two groups the total gastrectomy is a far more serious operation. It involves anastomosis of the esophagus. This difference is seen clearly in Finney's analysis:

TABLE 4.—*Finney's Paralysis*

	No. of Cases	Mortality	Greatest Length of Life
Total	67	54%	4 yrs. 2 mos.
Subtotal	60	25%	25 yrs.

The postoperative course has interested physiologists since the time of Czerny's first total gastrectomy in dogs in 1882 and Schlatter's first success in a human being in 1897. Finney reports that in all these cases of total gastrectomy there has been no complaint of hunger pain nor any sensation either of emptiness or fullness in the region of the stomach. This is an optimistic view. It is true that the dilatation of the lower end of the esophagus and the upper portion of the duodenum make up for the absence of the stomach as a reservoir. The digestion of these patients seems in no way inferior. They are apparently well nourished and in fairly good health. The action of the pepsin and hydrochloric acid is taken over by the trypsin of the pancreas. Digestion of proteins, fats, and carbohydrates have not been seriously affected. The production of severe anemia by total gastrectomy appears to be an exceptional consequence. In 1907 Moynihan reported a case of total gastrectomy. The patient died after three years and seven months. The autopsy showed nothing but a profound anemia. No recurrence of cancer.

9. *Operation for Recurrence.*—This will be rarely indicated. If at all, one will attempt this in a case where a patient has a local recurrence after a long period of well-being, and is in good general condition. Only a few operations for recurrence have been reported. In one case of Persson's of Stockholm the patient was subjected to resection for cancer twice within an interval of three years. He was still alive and well three years after the second operation.

10. *Indications in Advanced Age.*—I was confronted with the problem of advanced age recently. My patient, with a large cancer of the lesser curvature, was seventy-two years old. I removed more than one-half of the stomach and was fortunate in having a smooth recovery. This was three months ago. He is doing well and within four pounds of his normal weight. Horsley has recently published five cases in patients over seventy with only one death. Finsterer has had twenty-one cases above seventy with a surprisingly low mortality. I think that advanced age itself should not be a contraindication to radical cancer surgery. In older people, cancer is apt to be less malignant. Chances of permanent cure are better.

The question arises whether it is justifiable to do these extreme operations in view of the high mortality and the small percentage of permanent cures. For those of us who frequently do these operations this question comes up again and again. Before closing an abdomen after an exploratory laparotomy, it is well to remember that without any attempt at removal, the final mortality is 100 per cent. Very soon the patient begins questioning about the operation, and realizes we failed to do anything. After an exploratory laparotomy the average duration of life is three months. The patient has very little to lose in choosing operation.

After they have been fully informed of the seriousness of an operation of this kind, I think the patient's relatives should choose whichever course they want.

One question has to be considered. Will a high mortality so frighten the general public as to scare away early favorable cases? This is a serious warning to stay within reasonable limits. My own experience proves that every cancer patient that remains cured for a long time is an efficient booster for surgical treatment of cancer, offsetting the effect of cases that have died and been forgotten.

By attacking these advanced cases, at present, only occasional successes are possible. In order to achieve a higher average of surgical cures in gastric cancer, early diagnosis is imperative. Complete, conscientious surgery in radical operation for the favorable less-advanced cases is also imperative.

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DISCUSSION

LEO ELOESSER, M. D. (490 Post Street, San Francisco).—I agree completely with Doctor Gehrels' opinion. The instances can be very exceptional in which a patient and his relatives, once they have made up their minds to have his abdomen opened, would not prefer to take any reasonable operative risk in the hope of his being cured, rather than have him undergo the misery of an operation for nothing or for the short respite that a palliative operation affords. How far the surgeon will go depends upon his technical ability and his willingness to bear the onus of the high mortality that a higher percentage of cures entails.

The statistics cited by Doctor Gehrels may not give a perfectly true picture, for figures taken from municipal mortality records are not entirely comparable to the figures of surgical clinics to which patients go for the express purpose of being operated upon. Still the low percentage of resections, not only in city records but in the Mayo Clinic, is surprising.

I agree also with Doctor Gehrels in warning against two-stage operations in stomach cancer; too often a cancer that was operable at the first stage is found to be inoperable at the second.

A careful physical examination should decide for or against operation; if patients were excluded from operation who have demonstrable distant metastases, such as supraclavicular glands, umbilical metastases, nodules in the peritoneum of the Douglas pouch, bony metastases, and whose obstruction is not sufficient to indicate palliative gastro-enterostomy, both the patient and the surgeon's reputation would be helped.

This salesman of sixty-three, who is kind enough to appear tonight, was referred by Dr. B. J. Hagan with a huge movable abdominal mass. He was very anemic and had a tabes and an aortitis besides. He was operated upon on January 21, 1930; a large cancer of the greater curvature with a crater measuring two inches across was found. The gastrocolic ligament and the transverse colon were invaded. A large portion of the stomach, the mesocolon, and the transverse colon were resected. (Demonstration of specimen.) The man shows no evidence of recurrence, and is working. As Doctor Gehrels remarked, large, seemingly hopeless cancers are not infrequently resectable and remain cured.

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EDMUND BUTLER, M. D. (490 Post Street, San Francisco).—The list of deaths from cancer of the stomach in the city and county of San Francisco or any other municipality contain many cases that are not proven by exploratory laparotomy or autopsy, consequently an error of at least 20 per cent is undoubtedly present. I am surprised to learn so few patients with gastric cancer are operated upon.

I agree fully in every detail with Doctor Gehrels. The skilled surgeon should not be influenced by the high mortality following extensive resection, but be elated over the 12 to 20 per cent of five-year cures.

Finsterer routinely removes the greater omentum in all operations for abdominal neoplasms, hoping to remove any early implants which are more apt to lodge in this structure.

The two points in gastro-intestinal surgery that will bear stressing here are: First, the blood supply of the structures remaining should be sufficient to prevent sloughing. Second, the structures must be sutured without tension.

The permission to do extensive surgery must be had from the family. If relatives understand the import of the procedures, no criticism is forthcoming if sudden death should occur.

There is no statement in Doctor Gehrels' essay that would sanction extensive surgery where the general condition of the patient or the presence of irremovable metastasis precludes success.

THE PROBLEM OF CHRONIC ARTHRITIS*

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AT each annual meeting it is highly important to seek new light, fresh inspiration, and impetus in relation to the problems that bear heavily on us in our daily work. The problem of chronic arthritis has worried and harassed most of us, I am sure. Many members of the profession have become so casual in their efforts to solve this problem that sufferers from arthritis have turned by preference to osteopaths, chiropractors, physiotherapists, and hydrotherapists for help. Are we justified in trying to guide these sufferers back into the fold? Has science advanced far enough along solid ground to offer the chronic arthritic any definite assurance of help? It is perhaps true that nothing remarkable in the field of specific therapy has been brought forth in the last decade. Enthusiasm for vaccine therapy has been spasmodic and usually short-lived. Much groundwork of a careful nature has been quietly laid during the past ten years, and we are in a position today to survey a wide range of data bearing on this problem. A few workers in this country, outstanding among them Ralph Pemberton,[1] have viewed the disease of chronic arthritis in its entirety, conducting research and collecting data that bears on the problem from several different angles, until today we are beginning to envisage the disease as one with an underlying constitutional background and not a local disease of the joints, with its origin in focal infection. For the past fifteen years our attention has been almost entirely directed to focal infection, intensive research has been carried out with the endeavor to solve the problem through the finding of a specific organism which, through toxins or allergic properties, could be shown to cause all the manifestations of chronic arthritis. While this work has been of value it has fallen far short of our hopes for it. That infection is present in chronic arthritis and that it may play a part in the aggravation of symptoms seems to rest on sound evidence, but that these organisms may invade tissues and joints whose vitality becomes lowered from poor circulation and general systemic depletion, part of the picture of the general systemic background of arthritis, seems as logical as to impart to them the primary etiological rôle.

CLASSIFICATION—ATROPHIC AND HYPERTROPHIC TYPES

There has been too much confusion in attempted classification of arthritis. For practical purposes it is sufficient to recognize two main types of the disease, the atrophic and the hypertrophic type. These two main types can be readily separated by clinical and radiological examination. The atrophic variety affects women rather more frequently than men; it is preceded by a long period, often years of fatigue, physical strain, and mental worries. The individual is de-

* Chairman's address, General Medicine Section of the California Medical Association at the sixtieth annual session at San Francisco, April 27-30, 1931.